

Patent
Attorney Docket No. 005950-854

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of

Jeremy E. Dahl et al.

Application No.: 10/784,915

Filing Date: February 24, 2004

Title: DIAMONDROID-CONTAINING LOW DIELECTRIC CONSTANT MATERIALS

Group Art Unit: 1764

Examiner:

Confirmation No.: 1972

**FIRST
INFORMATION DISCLOSURE STATEMENT
TRANSMITTAL LETTER**

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Enclosed is a FIRST Information Disclosure Statement and accompanying form PTO-1449 for the above-identified patent application.

- ☒ No additional fee for submission of an IDS is required.
- ☐ The fee of \$180.00 (1806) as set forth in 37 C.F.R. § 1.17(p) is also enclosed.
- ☐ A statement under 37 C.F.R. § 1.97(e) is also enclosed.
- ☐ A statement under 37 C.F.R. § 1.97(e), and the fee of \$180.00 (1806) as set forth in 37 C.F.R. § 1.17(p) are also enclosed.
- ☐ Charge _____ to Deposit Account No. 02-4800 for the fee due.
- ☐ A check in the amount of _____ is enclosed for the fee due.
- ☐ Charge _____ to credit card. Form PTO-2038 is attached.

The Director is hereby authorized to charge any appropriate fees under 37 C.F.R. §§ 1.16, 1.17 and 1.21 that may be required by this paper, and to credit any overpayment, to Deposit Account No. 02-4800. This paper is submitted in duplicate.

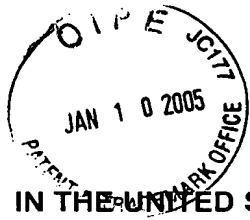
Respectfully submitted,

BURNS, DOANE, SWECKER & MATHIS, L.L.P.

P.O. Box 1404
Alexandria, Virginia 22313-1404
(650) 622-2300

By Stephen F. Powell
Stephen F. Powell
Registration No. 43,014

Date: 1-7-05



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of)	
)	
Jeremy E. Dahl et al.)	Group Art Unit: 1764
)	
Application No.: 10/784,915)	Examiner:
)	
Filed: February 24, 2004)	Confirmation No.: 1972
)	
For: DIAMONDOID-CONTAINING LOW)	
DIELECTRIC CONSTATNT)	
MATERIALS)	
)	
)	
)	

FIRST INFORMATION DISCLOSURE STATEMENT

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

In accordance with the duty of disclosure as set forth in 37 C.F.R. § 1.56, the accompanying information is being submitted in accordance with 37 C.F.R. §§ 1.97 and 1.98.

All of the listed documents were previously made of record in prior Application Serial No. 10/047,044, filed January 14, 2002, upon which Applicants rely for the benefits provided in 35 U.S.C. § 120. In accordance with 37 C.F.R. § 1.98, a copy of each of the listed documents, except those documents which were previously made of record in the prior application, is enclosed.

The documents are being submitted within three (3) months of the filing or entry of the national stage of this application or before the first Office Action on the merits, whichever is later. Since these documents are being filed within the time period set forth in 37 C.F.R. § 1.97(b), no fee or statement is required.

To assist the Examiner, the document is / documents are listed on the attached form PTO-1449. It is respectfully requested that an Examiner initialed copy of this form be returned to the undersigned.

Respectfully submitted,

BURNS, DOANE, SWECKER & MATHIS, L.L.P.

Date 1-7-05

By: Stephen F. Powell
Stephen F. Powell
Registration No. 43,014

P.O. Box 1404
Alexandria, Virginia 22313-1404
(650) 622-2300

Substitute for form 1449A/PTO

JAN 10 2005

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

ATTORNEY'S DKT NO.
005950-854

APPLICATION NO.
10/784,915

APPLICANT
Jeremy DAHL et al.

FILING DATE
February 24, 2004

GROUP
1764

U.S. PATENT DOCUMENTS

Examiner Initials	U.S. Patent Document		Name of Patentee or Applicant of Cited Document	Date of Publication (MM-DD-YYYY)
	Number	Kind Code (if known)		
	3,457,318		Capaldi et al.	7/22/69
	3,832,332		Thompson	8/27/74
	4,142,036		Feinstein et al.	2/27/79
	4,273,561		Fernandez-Moran Villalobos	6/16/81
	4,952,747		Alexander et al.	8/28/90
	4,952,748		Alexander et al.	8/28/90
	4,952,749		Alexander et al.	8/28/90
	4,982,049		Alexander et al.	1/1/91
	4,996,079		Itoh	2/26/91
	5,015,758		Pilgrim et al.	5/14/91
	5,017,734		Baum et al.	5/21/91
	5,019,660		Chapman et al.	5/28/91
	5,019,665		Partridge et al.	5/28/91
	5,053,434		Chapman	10/1/91
	5,146,314		Pankove	09/08/92
	5,238,705		Hayashi et al.	8/24/93
	5,245,104		Cullick	9/14/93
	5,246,198		Kurihara	09/1993
	5,256,391		Chen et al.	10/26/93
	5,268,513		Shen	12/7/93
	5,298,666		Shen	3/29/94
	5,306,851		Wu et al.	4/26/94
	5,308,661		Feng et al.	5/3/94
	5,313,094		Beyer et al.	5/17/94
	5,319,518		Blood	6/7/94
	5,347,063		Shen et al.	9/13/94
	5,367,051		Narang et al.	11/22/94
	5,369,213		Shen	11/29/94
	5,380,947		Chen et al.	1/10/95
	5,382,684		Moini et al.	1/17/95
	5,394,733		Acholla	3/7/95
	5,397,488		Chen et al.	3/14/95
	5,397,558		Miyanaga et al.	03/1995

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. SEND TO: Assistant Commissioner for Patents, Washington, D.C. 20231.

Substitute for form 1449A/PTO	ATTORNEY'S DKT NO.	APPLICATION NO.
	005950-854	10/784,915
	APPLICANT	
	Jeremy DAHL et al.	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT	FILING DATE	GROUP
	February 24, 2004	1764

	5,410,092	Shen	4/25/95
	5,414,189	Chen et al.	5/9/95
	5,416,188	Chiang et al.	5/16/95
	5,430,193	Shen	7/4/95
	5,449,531	Zhu et al.	9/12/95
	5,455,072	Bension et al.	10/3/95
	5,461,184	Swanson	10/24/95
	5,462,680	Brois et al.	10/31/95
	5,462,776	Gruen	10/31/95
	5,498,812	Bradway et al.	3/12/96
	5,540,977	Vogelsang et al.	7/30/96
	5,547,748	Ruoff et al.	8/20/96
	5,576,355	Chen et al.	11/19/96
	5,578,901	Blanchet-Fincher et al.	11/26/96
	5,628,920	Fuesser et al.	05/1997
	5,635,581	Chiang et al.	6/3/97
	5,695,847	Browne	12/9/97
	5,739,376	Bingel	4/14/98
	5,767,578	Chang et al.	6/16/98
	5,773,921	Keesmann et al.	6/30/98
	5,780,101	Nolan et al.	7/14/98
	5,849,130	Browne	12/15/98
	5,861,135	Tanabe et al.	1/19/99
	5,874,175	Li	2/23/99
	5,874,775	Shiomi et al.	2/23/99
	5,880,154	Boukrinskaia et al.	3/9/99
	5,907,189	Mertol	5/25/99
	5,925,465	Ebbesen et al.	7/20/99
	5,958,523	Bradic	9/28/99
	5,965,202	Taylor-Smith et al.	10/12/99
	5,976,909	Shiomi et al.	11/2/99
	6,080,470	Dorfman	6/27/00
	6,162,412	Fujimori et al.	12/19/00
	6,174,780	Robinson	1/16/01
	6,187,427	Taylor-Smith et al.	2/13/01
	6,211,463	Fabis	4/3/01

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. SEND TO: Assistant Commissioner for Patents, Washington, D.C. 20231.

Substitute for form 1449A/PTO INFORMATION DISCLOSURE STATEMENT BY APPLICANT	ATTORNEY'S DKT NO. 005950-854	APPLICATION NO. 10/784,915
	APPLICANT Jeremy DAHL et al.	
	FILING DATE February 24, 2004	GROUP 1764

	6,222,113	Ghoshal	4/24/01
	6,235,851	Ishii et al.	5/22/01
	6,250,984	Jin et al.	6/26/01
	6,256,996	Ghoshal	7/10/01
	6,261,942	Zhou et al.	7/17/01
	6,277,766	Ayers	8/21/01
	6,286,212	Eaton	9/11/01
	6,300,410	Shachat et al.	10/9/01
	6,312,768	Rode et al.	11/6/01
	6,316,084	Claus et al.	11/13/01
	6,316,826	Yamamoto et al.	11/13/01

FOREIGN PATENT DOCUMENTS						
Examiner Initials	Foreign Patent Document		Country	Date of Publication (MM-DD-YYYY)	Translation	
	Number	Kind Code (if known)			Yes	no
	WO 95/11472		PCT	4/27/95		
	EP 0399851		Europe	11/20/96		
	WO 95/06019		PCT	03/02/1995		
	WO 92/13909		PCT	08/20/1992		
NON PATENT LITERATURE DOCUMENTS						
Examiner Initials	Include name of author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.					
	Aczel, et al., "Stability of Adamantane and its Derivatives to Coal-liquefaction Conditions, and its implications toward the organic structure of Coal," <i>Fuel</i> , Vol. 58, pp. 228-230, (3/1979)					
	Ansell, M., "Diamond Cleavage," publication unknown (4 pages)					
	Balaban, et al., Systemic Classification and Nomenclature of Diamond Hydrocarbons-I, <i>Tetrahedron</i> , 34, pp. 3599-3606, (1978)					
	Badziag, P., et al., "Nanometre-sized Diamonds are More Stable than Graphite," <i>Nature</i> , Vol. 343, pp. 244-245, and 517 (1/1990)					
	Bagrii, Ye, et al., "Catalytic Breakdown of Paraffinic Hydrocarbons in the Presence of Adamantanes," <i>Petrol. Chem USSR</i> , Vol. 30, No. 2, pp. 131-134, (1990)					
	Baughman, GL, "Dibromination of Adamantane," Publication Unknown, Vol. 29, pp. 238-240 (January 1964).					
	Bhushan, B., (editor), "Influence of Film Structure and Composition on Some Typical Properties," <i>Modern Tribology Handbook</i> , Vol. Two, p. 891.					
	Bhushan, B., (editor), "Self-Assembled Monolayers for Controlling Hydrophobicity and/or Friction					

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. SEND TO: Assistant Commissioner for Patents, Washington, D.C. 20231.

Substitute for form 1449A/PTO	ATTORNEY'S DKT NO.	APPLICATION NO.
	005950-854	10/784,915
	APPLICANT	
	Jeremy DAHL et al.	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT	FILING DATE	GROUP
	February 24, 2004	1764

	and Wear," in <i>Modern Tribology Handbook</i> , Ch. 25, pp. 909-929.
	Bobrov, K., et al., "Atomic-scale Imaging of Insulating Diamond through Resonant Electron Injection," <i>Nature</i> , Vol. 413, pp. 616-619 (10/11/01).
	Bott, Von K., "Synthese von Adamantan-und Norbornan chloressigsäuren mit Trichloräthylen," <i>Angew. Chem.</i> , Vol. 79, pp. 943-945 (1967).
	Broich, F., "Carbonsäuresynthesen mit 1,1-Dichloräthylen," <i>Angew. Chem.</i> , vol. 78, pp. 932-936 (1966).
	Cammas, S., et al., "Poly(β -malic acid): Obtaining High Molecular Weights by Improvement of the Synthesis Route," <i>Polymer</i> , Vol. 37, No. 18, pp. 4215-4220 (1996).
	Chung, et al., Recent Developments in High-Energy Density Liquid Fuels, <i>Energy Fuels</i> , <u>13</u> , pp. 641-649, (1999).
	Courtney, T., et al., "The Chemistry of Diamantane: Part 1 - Synthesis and Some Functionalisation Reactions," <i>J.C.S. Perkin I</i> , pp. 2691-2696 (1972).
	Dahl, J., et al., Diamondoid Hydrocarbons as Indicators of Natural Oil Cracking, <i>Nature</i> , <u>399</u> , pp. 54-57, (1999)
	Das, M., (editor), "Diamond-Like Amorphous Carbon Films" as presented at Physics of Novel Materials, Proceedings of the Tenth Physics Summer School, Canberra, Australia, January 13-31, 1997, p. 221,
	Dresselhaus, MS, et al., "Nanotechnology in Carbon Materials," <i>Nanotechnology</i> , Ch. 7, pp. 285-329, AIP Press (1999)
	Drexler, Eric K., <i>Nanosystems: Molecular Machinery Manufacturing and Computation</i> , John Wiley & Sons, pp.238-249, (1992)
	Erdemir, Ali, et al., "Tribology of Diamond, Diamond-Like Carbon and Related Films," <i>Modern Tribology Handbook</i> , Vol. Two, Ch. 24, CRC Press LLC, pp. 871-908, (1999).
	Fort, Jr., et al., Adamantane: Consequences of the Diamondoid Structure, <i>Chem. Rev.</i> , <u>64</u> , pp. 277-300, (1964)
	Gruen, D.M., "Applications of Ultrananocrystalline Diamond Films," publication unknown, pp. 313-317 (January 2000).
	Gruen, D.M., "Microstructure and Grain Boundaries of Ultrananocrystalline Diamond Films," publication unknown, pp. 307-312, (January 2000).
	Gruen, D.M., "Nucleation of Ultrananocrystalline Diamond Films," publication unknown, pp. 303-306 (January 2000).
	Haaf, W., "Untersuchungen über die Ritter-Reaktion," <i>Jahrg-96</i> , pp. 3359-3369 (1963) (In German).
	Hala, V.S., et al., "Analyse Und Verwendung von Pyrolyseol," <i>Jahrgang</i> , pp. 85-88, (2/1971) In German- English Abstract on page 85.
	Koch, H. et al., "Direkte Syntese der Adamantan-carbonsäure-(1)," <i>Eingegangen Am.</i> , <u>29</u> , p. Z 944 (1960).
	Kopidakis, G., et al., "Discrete Breathers in Realistic Models: Hydrocarbon Structures," <i>Physica B</i> , Vol. 296, pp. 237-250 (2001).

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. SEND TO: Assistant Commissioner for Patents, Washington, D.C. 20231.

Substitute for form 1449A/PTO	ATTORNEY'S DKT NO. 005950-854	APPLICATION NO. 10/784,915
	APPLICANT Jeremy DAHL et al.	
	FILING DATE February 24, 2004	GROUP 1764
	<p align="center">INFORMATION DISCLOSURE STATEMENT BY APPLICANT</p>	

	Kulisch, W., "Nucleation of Diamond," <i>Deposition of Diamond-Like Superhard Materials</i> , Ch. 4.2, pp. 134-141, Springer-Verlag, Berlin-Heidelberg, (1999).
	Kulisch, W., "Table 1. Physical Constants for C ₆₀ Molecules and for Crystalline C ₆₀ ," <i>Deposition of Diamond-Like Superhard Materials</i> , p. 290, Springer-Verlag, Berlin-Heidelberg, (1999).
	Liaw, Der-Jang, et al., "Synthesis and Characterization of new Polyamides and Polyimides Prepared from 2,2-bis[4-(4-aminophenoxy)phenyl]adamantane," <i>Macromol. Chem. Phys.</i> , 200, No. 6, pp. 1326-1332 (1999)
	Lifshitz, et al., "The Mechanism of Diamond Nucleation from Energetic Species", <i>Science</i> 297 :1531-1533 (2002).
	Lin, et al., Natural Occurrence of Tetramantane (C ₂₂ H ₂₃), Pentamantane (C ₂₆ H ₃₂) and Hexamantane (C ₃₀ H ₃₆) in a Deep Petroleum Reservoir, <i>Fuel</i> , 74:10, pp. 1512-1521, (1995)
	McKervey, Synthetic Approaches to Large Diamondoid Hydrocarbons, <i>Tetrahedron</i> , 36 , pp. 971-992, (1980)
	Machacek, V., et al., "Let Od Objeveni Adamantanu," <i>Chemicke Listy/svazek</i> , 76, pp. 753-761, (1982) (Russian - English Abstract on p. 761).
	Moine, L., et al., "Polymers of Malic Acid Conjugated with the 1-adamantyl Moiety as Lipophilic Pendant Group," <i>Polymer</i> , Vol. 38, No. 12, pp. 3121-3127 (1997).
	Moiseev, IK, et al., "Reactions of Adamantanes in Electrophilic Media," <i>Russian Chem. Reviews</i> , Vol. 68, No. 12, pp. 1001-120 (1999).
	Oya, A, et al., "Carbonization of Adamantanes to a Graphitizable Carbon," <i>Fuel</i> , Vol. 60, pp. 667-669, (8/1981).
	Petrov, A., "Hydrocarbons of Adamantane Series as Indices of Petroleum Catagenesis Process," <i>Advances in Organic Geo Chemistry</i> , 6 th International Meeting on Organic Geochemistry, pp. 517-522 (1973).
	Prawer, S., "The Wonderful World of Carbon," appearing in <i>Physics of Novel Materials</i> , Proceedings fo the Tenth Physics Summer School, Canberra, Australia, pp. 205-234, January 13-31, 1997.
	Prusova, D., "Liquid Chromatography of Adamantanes and Carbon Adsorbents, <i>J. Chrom</i> , 234, pp. 1-11, (1982).
	Piekarczyk, "Crystal Growth of CVD Diamond and Some of Its Peculiarities", <i>Crystal Research and Technology</i> 34 (5-6):553-563 abs only (1999).
	Rollmann, L., et al., "Adamantanes from Petroleum with Zeolites," <i>Catalyst Today</i> , Vol. 31, pp. 163-169 (1996).
	Rouhi, A., et al., "Tinkertoy Dreams: Someday, Computers May be Run by Electronic Circuits Based on Single Giant Molecules," <i>Science and Technology</i> , pp. 46-49 (7/30/01).
	Sandia National Laboratories (2000), World's First Diamond Micromachines Created at Sandia, Press Release, (2/22/2000), www.Sandia.gov
	Schleyer, P., et al., "Nonacyclo[11.7.1.1 ^{2,18} .0 ^{3,16} .0 ^{4,13} .0 ^{5,10} .0 ^{6,14} .0 ^{7,11} .0 ^{15,20}]-Docosane ¹ , a Bastard ² Tetramantane," <i>J. of the Am. Chem. Soc.</i> , 90:8, letter to the editor, (8/28/68).
	Shen, M., et al., "Finite T _d Symmetry Models for Diamond: From Adamantane to Superadamantane

Substitute for form 1449A/PTO	ATTORNEY'S DKT No.	APPLICATION No.
	005950-854	10/784,915
	APPLICANT	
	Jeremy DAHL et al.	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT	FILING DATE	GROUP
	February 24, 2004	1764

	(C ₃₅ H ₃₆), <i>J. Am., Chem. Soc.</i> , Vol. 114, No. 2, pp 497-505, (1992).		
	Smith, G., et al., "Some Reactions of Adamantane and Adamantane Derivatives," <i>publication unknown</i> , Vol. 26, pp. 2207-2212 (1961).		
	Stetter, H., et al., "Monofunktionelle Adamantan-Derivate," <i>Angew. Chem.</i> , Vol. 71, pp.429-430 (1959).		
	Supryadkina, N.Y., et al., "Catalytic Dealkylation of Alkyladamantanes," <i>Petrol. Chem., USSR</i> , Vol. 28, No. 2, pp. 103-110, (1988)		
	Tachikawa, T., "Assembly and Packaging," <i>ULSI Technology</i> , Ch. 10, pp. 530-586, McGraw-Hill, (1996).		
	Timp, Gregory (editor), "Table 2.1 - Diamond Like Materials," <i>Nanotechnology</i> , Ch. 2, p. 28, AIP Press (1999).		
	Tominaga, K., et al., "Next-generation Fine Chemicals Raw Material-Adamantane," <i>Chem. Econ. & Eng. Review</i> , Vol. 17, No. 10, pp. 23-36 (10/1985).		
	Vodicka, L, et al., "High Performance Liquid Chromatography of Halogeno Derivatives of Adamantane and Diamantane," <i>J. Chrom</i> , 270, pp. 199-205, (1983).		
	von R. Schleyer, P., et al., "The Preparation and Reactivity of 2-Substituted Derivatives of Adamantane" <i>Frick Chemical Laboratory</i> , Vol. 83, pp. 182-187 (1961).		
	Windischmann, H., "CVD Diamond for Thermal Management," <i>publication unknown</i> , Chapter C2.2, pp. 410 - 415 (January 2002).		
	Wingert, W., "G.c.-m.s. Analysis of Diamondoid Hydrocarbons in Smackover Petroleums," <i>Fuel</i> , Vol. 71, pp. 37-42, (1/1992)		
	Wolf, S., (editor), "Dielectric materials for Multilevel Interconnects," <i>Silicon Processing for the VLSI Era</i> , Ch. 4.3.2, pp. 194-199, Lattice Press, (1990).		
	Yokoyama, T., et al., "Selective Assembly on a Surface of Supramolecular Aggregates with Controlled Size and Shape," <i>Letters to Nature</i> , Vol. 413, pp. 619-621, (10/11/01).		
	Zhu, W., et al., "Novel Cold Cathode Materials," <i>Vacuum Microelectronics</i> , Ch. 6, pp. 247-287, John Wiley & Sons, Inc., (2001).		
Examiner Signature		Date Considered	

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. SEND TO: Assistant Commissioner for Patents, Washington, D.C. 20231.